

# Kantronics

Pacterm  
Serial Communication  
with Kantronics TNCs

## User's Guide

### ATTENTION

This manual is for use with Pacterm 2.0 and the following Kantronics TNCs:

- \* KPC family
- \* KAM family

For convenience, this manual refers to the KPC-3. If you are using Pacterm 2.0 with another model of TNC, make the appropriate name change as you read.

Pacterm 2.0 and this manual replace previous Pacterm material in your TNC documentation. Refer to your TNC documentation for information on topics other than Pacterm.



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# PACTERM

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## Introduction

Pacterm is a DOS-based terminal communication program used to control the flow of information between your PC compatible computer and your KPC-3.

Pacterm is shipped with the KPC-3 to help you get started using your KPC-3 for packet radio communication. Pacterm is for use while the KPC-3 is operating in NEWUSER Interface Mode (the default mode of operation) or in TERMINAL Interface Mode, which includes all NEWUSER commands and many more.

You may continue using Pacterm with your KPC-3 after you get up and running, but you do not need to limit yourself to Pacterm. The KPC-3 will operate with a wide range of terminal communication programs, including the terminal communication program that comes with Microsoft Windows. Some of these other communication programs offer more functionality than Pacterm.

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**Technical Note:** *With appropriate cabling, software and adapters, the KPC-3 also will operate with non-PC compatible computers and “dumb terminals.”*

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## Our Assumptions about You

We assume the following when you use Pacterm with your KPC-3:

- You are using a PC compatible computer that meets the specifications given in your KPC-3 documentation.
- You know, or are learning, how to use DOS with your PC compatible computer for basic operations needed to install and run Pacterm.
- You have a KPC-3 that is connected, or that will be connected, to your PC computer, as described below and in the KPC-3 manual.
- You know, or are learning, how to use your KPC-3 in NEWUSER and/or TERMINAL Interface Mode, along with your PC compatible computer and your transceiver, for packet radio operations.

## Overview

You can use Pacterm to do the following:

- Establish communications between your computer and your KPC-3, while it is operating in NEWUSER or TERMINAL Interface Mode.
- Select the COM PORT and BAUD RATE to use for the current Pacterm session (i.e., until you exit to DOS).
- Send commands from Pacterm to your KPC-3.
- Send data from Pacterm (i.e., from your computer) to your KPC-3 and receive data from your KPC-3.
- VIEW, PRINT, and/or SAVE information sent from your KPC-3 to your computer.
- End a session, either of two ways:
  - Disconnect and EXIT to DOS.
  - EXIT directly to DOS.

Other uses of Pacterm are as follows:

- SEND a file from your computer to your KPC-3, for transmission.
- Switch the KPC-3 at any time into Command Mode, making it ready to accept commands instead of transmitting data.
- Control the flow of data between Pacterm and your KPC-3, as follows:
  - From Pacterm to your KPC-3: Switch between (1) ONLINE, with your input sent immediately or (2) OFFLINE, with input stored in a type-ahead buffer and sent when you go back ONLINE.
  - From your KPC-3 to Pacterm: STOP (hold) or START the flow of data from your KPC-3 to your computer.

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**Technical note:** *Also, as described briefly in this document, Pacterm can be used with KAM TNCs to operate in HF non-packet modes.*

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## Quick Start

To get started right away using PaTerm to communicate with your KPC-3:

1. Copy the file PACTERM.COM from your "Kantronics Program and Information Disk" to your hard drive, using DOS or following directions on the disk.
2. Connect your KPC-3 to COM1 or COM2 of your computer, using a standard RS-232C serial modem cable, and make sure the KPC-3 is turned ON.
3. Use DOS to change to the drive and directory to which you copied PaTerm.
4. Start PaTerm by typing PACTERM and pressing the ENTER key.
5. When PaTerm starts, you will be on the MAIN Menu. Use the SETUP functions on the MAIN menu as needed to establish communication with your KPC-3. The BACKSPACE key will take you to the TERMINAL Screen. Follow the on-screen instructions and use the MAIN Menu and the TERMINAL Screen to control the session and communicate with the KPC-3.
6. If you get the "PaTerm Cannot Communicate" screen the first time you try to go to the TERMINAL Screen, be sure the KPC-3 is turned ON and/or press the F7 key to switch the current COM port from COM2 to COM1. If neither of these works, review other possible problems (described on the screen) and keep trying until you establish communication.
7. The first time your KPC-3 is used, it will run an AUTOBAUD routine to coordinate the KPC-3's BAUD rate with the BAUD rate of the terminal communication software in use at the time — in this case, PaTerm. Follow the on-screen instructions, which include entering your CALLSIGN, and then proceed.

You may be able to get up and running without reading any more of this PaTerm documentation, but you will find much useful information below, including: (1) detailed explanations of each function, (2) helpful hints, (3) cautions that warn of possible problems, and (4) technical notes for those who are interested in knowing more about a particular topic.

## Installing Pacterm

Installing Pacterm is a simple matter. You will copy the program file PACTERM.COM to your computer's hard drive or to a floppy disk. You will find the file PACTERM.COM on the floppy disk titled "Kantronics Program and Information: Disk 1," that is shipped with the KPC-3.

**Caution:** To reduce the chance of problems later, make a backup copy of this shipping disk and write-protect both the original and your backup copy.

### Saving Pacterm on your hard drive

You may copy Pacterm to your hard drive just by using DOS commands or by following the steps given on the "Kantronics Program and Information" disk.

#### Copying files from a floppy to your hard drive

You may install Pacterm on your hard drive by simply copying the Pacterm program file to the drive and directory or subdirectory of your choice, as follows:

1. Change to the main directory (e.g., C:\) or an existing subdirectory of your hard drive (e.g. C:\COMM),  
**Hint:** To create a new directory in which to save Pacterm, use the DOS **make directory** command. For example, if your hard drive is drive C and you want to create a new directory called PACTERM in which to store the program (also called Pacterm), first change to drive C (type and enter C:) and then type and enter **MD \PACTERM** — being sure to include the backslash. Then change to the new directory by using the **change directory** command: type and enter **CD \PACTERM** — again, be sure to include the backslash.
2. Put the "Kantronics Program and Information" disk in floppy Drive A (or B), and
3. Type **COPY A (or B):PACTERM.COM** and press the ENTER key. This will copy PACTERM.COM to your current directory (shown at your DOS prompt).

## Guided Installation

Another way to install Pacterm on your hard drive is to use the ***Kantronics Program and Information*** disk to guide you through the steps, as follows:

1. Put the ***Kantronics Program and Information*** disk (or a backup) in a floppy drive (e.g., A or B) and, if you are not already there, change to the floppy drive where you put this disk (e.g., type and enter A: or B: as appropriate),
2. Type TNC and press the ENTER key, to start the TNC program, and use the on-screen menus to select PACTERM, then INSTALL PACTERM, and then follow the on-screen instructions,
3. Type and enter the drive to which you want Pacterm copied (e.g., C), which can be any drive (except the floppy drive with the ***Kantronics Program and Information*** disk in it) that has the space for it,
4. Next, type and enter the directory or subdirectory (e.g., \PACTERM) to which you want Pacterm (the program) copied. If you specify a directory or subdirectory that does not already exist, the installation program will create it and then copy PACTERM.COM there.
5. Check the on-screen confirmation of the installation and EXIT to DOS.

## Saving Pacterm on a floppy disk

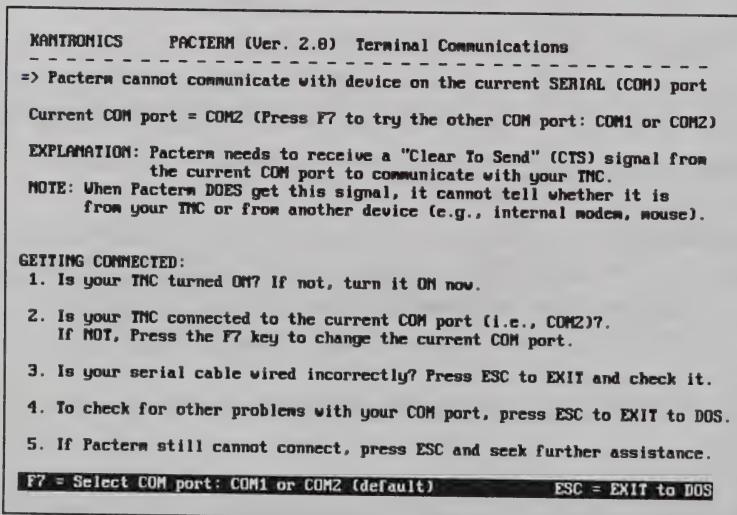
You may use the Pacterm program on the backup copy of the “Kantronics Program and Information: Disk 1” disk or on another floppy disk (a disk to which you have copied the file named “PACTERM.COM”). In this case, you do not need to do anything special to install it. Just follow the “Starting Pacterm” instructions given below.

# Establishing Communication

For Pacterm to communicate with your KPC-3, these conditions must be met:

- The KPC-3 is turned ON.
- The KPC-3 is connected to your computer's COM1 or COM2 port and Pacterm is set to expect it on the COM port to which it is connected.
- The PC computer and the KPC-3 are connected via a standard RS-232C serial modem cable, or at least by the 5-wire cabling described in the KPC-3 documentation.
- The COM port is functioning properly (e.g., cable is plugged in securely).
- There are no other faults in the normal operations of the components or connections between them.

When you first try to communicate with the KPC-3, Pacterm checks for a signal from the current COM port that is consistent with a KPC-3. If it does *not* find such a signal, Pacterm presents the "Pacterm cannot communicate" screen shown below, for your use in establishing the connection.



If you have further difficulty establishing or maintaining communications, see the trouble-shooting section of this manual for possible solutions.

# Starting Pacterm

To start Pacterm, once you have connected your KPC-3 to your computer:

1. Use DOS to go to the drive and directory where you have installed Pacterm. For example, if you copied Pacterm to “C:\COMM” by using the Install program, type “C:\COMM”, then press the ENTER key and you will see the prompt “C:\COMM”.  
☞ **Hint:** If you are using Microsoft Windows 3.1 or above, you can use the Program Manager, File Manager, or click on the DOS icon in the Main Window to run Pacterm as a DOS program from within Windows. But do *not* run any another program at the same time as Pacterm, or you may lose data.
2. Type PACTERM and press the ENTER key.  
☞ **Hint:** The drive and directory from which you call Pacterm does not need to be the same as that where the program is stored. From Pacterm’s point of view, the current drive and directory (e.g., used for SAVING the Holding Buffer) is the drive and directory from which you start Pacterm. For example, suppose the program PACTERM.COM is in C:\COMM (i.e., drive C, directory COMM) and you are on directory SAVEBUFF on a disk in drive A (A:\SAVEBUFF). In this case, the DOS command C:\COMM\PACTERM will start Pacterm and the current drive and directory will be A:\SAVEBUFF.
3. The first screen you will see is the MAIN Menu screen. Use the SETUP functions as needed, then you are ready to go on to the Terminal Screen.
4. Press the BACKSPACE key on the MAIN Menu to go to the Terminal Screen and begin using Pacterm for communicating with your KPC-3.
5. If Pacterm cannot establish communication, it will assist by presenting a “Pacterm cannot communicate” screen (shown above), which describes steps you can take to establish communication. You may just need to turn on your KPC-3 and/or press the F7 key to tell Pacterm to try communicating through COM1, instead of the default serial port, COM2. As soon as Pacterm can communicate, it gives you the MAIN Menu, so you can try again.

## Coordinating Pacterm and Your KPC-3

The values of several KPC-3 parameters influence how Pacterm communicates with the KPC-3.

### Coordinating BAUD Rates: The Autobaud Routine

The first time your KPC-3 is used, it runs an AUTOBAUD routine to assure that the KPC-3 baud rate is the same as that of Pacterm (or whatever communication software is in use at the time).

The KPC-3's AUTOBAUD routine works as follows:

1. AUTOBAUD sends and resends the message “PRESS (\*) TO SET BAUD RATE” to Pacterm, at one baud rate after another. When the KPC-3’s baud rate matches that of Pacterm, you can read this message in a window on your screen; if the two rates do not match, the message appears garbled.
2. Any time while this message is being sent, whether it is readable or garbled on your screen, enter the “\*” character (SHIFT+8 key combination).

---

**Version Note:** *If you are using a version of the KPC-3 prior to Version 6.0, you need to press the “\*” key while the message asking you to do so is readable, and not when the message appears garbled.*

---

3. When the AUTOBAUD routine receives, the “\*” character from the serial port, it uses that character to determine Pacterm’s BAUD rate.
4. AUTOBAUD then sets the KPC-3’s BAUD rate to match Pacterm’s BAUD rate. The KPC-3’s BAUD rate will be set to 9600 (Pacterm’s default BAUD rate) unless Pacterm’s BAUD rate was changed before running AUTOBAUD.

---

**Technical note:** *The KPC-3’s BAUD rate is stored in the KPC-3 as the value of the ABAUD parameter, so when you use the KPC-3 later, it will start with that BAUD rate. This is made possible by an internal lithium battery supplied with the KPC-3. Later, you can change the KPC-3 BAUD rate if you want, as long as you change Pacterm’s BAUD rate to match the new KPC-3 BAUD rate.*

---

5. Finally, AUTOBAUD: (1) sends a “sign-on” message and (2) asks for the user’s CALLSIGN, which will also be stored in the KPC-3 and used until changed. At this point, the user is ready to give commands to the KPC-3.

☞ **Hint:** Do not confuse the KPC-3’s baud rate for serial communication on the *computer* port with the KPC-3’s 1200 baud rate for communicating using a *radio* port, which is connected by a custom-wired cabling to a transceiver.

## Configuring the KPC-3 for use with Pacterm

There are several KPC-3 settings in addition to ABAUD (baud rate) and CALLSIGN that you may wish to change, especially if parameter values in your KPC-3 have been changed from their default settings. Even if you do not want to change anything now, knowing about these parameters and knowing how to reconfigure your KPC-3, gives you more control in using it with Pacterm.

☞ **Hint:** See the KPC-3 documentation for full descriptions of KPC-3 parameters, instructions on how to see the current values of KPC-3 parameters, and instructions on how to change them.

## Required KPC-3 Parameter Settings

To work with Pacterm, the following KPC-3 parameter settings are needed:

- PARITY = NONE (default = NONE, so unless this has been changed, you do not need to do anything).

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**Technical note:** *Pacterm communicates using: 8 bits words, no parity check, and 1 stop bit.*

---

- COMMAND = \$03 (CTRL+C) (default = \$03, so unless this has been changed, you do not need to do anything).

☞ **Hint:** This KPC-3 parameter sets the code used for **COMMAND**. Pacterm has a fixed code that it sends for **COMMAND** and it is the same as the KPC-3 default value (HEX \$03, which is **CTRL+C** from the user’s point of view). That is, Pacterm assumes the KPC-3 **COMMAND** parameter is set to its default value; if it is not, Pacterm commands that send **CTRL+C** codes to the KPC-3 will not work correctly.

- Each of the following KPC-3 parameters needs to be set to its default value, shown below, if it has been changed to a non-default value:
  - CANLINE default = CTRL+X (HEX \$18)
  - CANPAC default = CTRL+Y (HEX \$19)
  - PASS default = CTRL+V (HEX \$16)

## Optional Parameter Settings

The following KPC-3 parameters are generally used with their default settings when running Pacterm, but you may wish to change them. If they have been set to non-default values, you may wish to change them back.

- ECHO = ON (default)
- FLOW = ON (default)

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**Technical note:** *Usually, ECHO and FLOW go together; both ON or both OFF. When using software that supports split screen displays, for example, set both ECHO and FLOW to OFF.*

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- XFLOW = ON (default)

---

**Technical note:** *XFLOW controls whether or not software flow control is ON. If XFLOW is set to OFF, the following parameters should also be set to 0 (zero): XON, XOFF, START, and STOP.*

---

- FILTER = OFF (default)
- 8BITCONV = ON (default)

 **Hint:** Also, the **MONITOR** parameter may be ON or OFF (default = ON), depending on whether or not Pacterm is in use. You may have Monitor ON while using Pacterm. But to prevent a build-up of data in an internal buffer in the KPC-3, you should turn Monitor OFF when exiting Pacterm **and** leaving the KPC-3 ON. This is because when the KPC-3's receive buffer is full, your station will give a **BUSY** signal to other stations that try to connect.

# Pacterm Screens

Pacterm has two screens for your use in working with your KPC-3:

- A MAIN Menu Screen, for setting up the communication, and
- A TERMINAL Screen, for sending commands and data to your KPC-3, viewing data sent to Pacterm by your KPC-3, and using the functions described on the MAIN Menu (except SETUP functions and ESC).

## The MAIN Menu Screen

As shown below, the MAIN Menu screen shows all the functions available in Pacterm and serves as a "Help" screen as well.

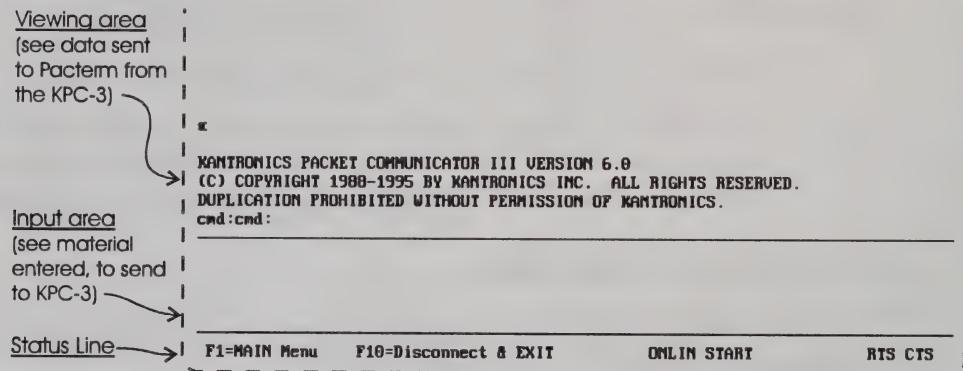
| KAMTRONICS   | PACTERM (Ver. 2.0) | Terminal Communications              | MAIN MENU |
|--|--------------------|--------------------------------------|-----------|
| Current SETUP: TMC USE = Packet,   |                    | SERIAL PORT = COM2, BAUD RATE = 9600 |           |
| <b>NOTE: Going to TERMINAL Mode when the current SERIAL (COM) PORT is not connected to a TMC may require restarting your computer.</b> |                    |                                      |           |
| <b>Press BACKSPACE to go to TERMINAL Screen</b>  |                    | <b>ESC = EXIT to DOS</b>             |           |
| <b>SETUP (and remain on the MAIN MENU)</b>   |                    |                                      |           |
| F3 = Select TMC USE: Packet (default) or HF Non-Packet   |                    |                                      |           |
| F7 = Select SERIAL PORT: COM1 or COM2 (default)  |                    |                                      |           |
| F8 = Select BAUD RATE: 300, 600, 1200, 2400, 4800, or 9600 (default)   |                    |                                      |           |
| <b>CONTROL THE FLOW OF DATA BETWEEN PACTERM AND TMC</b>  |                    |                                      |           |
| F5 = PACTERM -> TMC: OFFLINE/ONLINE (i.e., type ahead/immediate transmit)  |                    |                                      |           |
| F6 = TMC -> PACTERM: STOP/START (RE: OK for TMC to send data to Pacterm)   |                    |                                      |           |
| <b>OUTPUT CONTROL</b>  |                    |                                      |           |
| ALT+P = Printer: ON/OFF  |                    |                                      |           |
| ALT+B = Holding Buffer: OPEN/CLOSE   |                    |                                      |           |
| ALT+C = Holding Buffer: CLEAR  |                    |                                      |           |
| F2 = Holding Buffer: SAVE & CLEAR  |                    |                                      |           |
| ALT+F = File: SEND to TMC  |                    |                                      |           |
| <b>EXIT</b>  |                    |                                      |           |
| F9 = Go to TMC "Command" mode  |                    |                                      |           |
| F10 = Disconnect and EXIT to DOS   |                    |                                      |           |

Each MAIN Menu function is described in detail later in this manual.

To go to the TERMINAL Screen from the MAIN Menu, press the BACKSPACE key or use any MAIN Menu function other than SETUP functions, F10, or ESC.

## The Terminal Screen

As shown below, the Terminal Screen is in three parts:



### The Status Line

The Status Line gives the following information, from left to right on the line:

- Reminders of how to get to the MAIN Menu and how to EXIT to DOS.
- The current status of Flow Control Functions:
  - Shows whether the user has set Pacterm to send data immediately to the KPC-3 (ONLIN) or to hold data to send it later (OFLIN).
  - Shows whether the user has set Pacterm to request the KPC-3 to send data (START) or *not* to send data (STOP) .
- The current status of Output Control Functions:
  - If the PRINT request is ON, PRINT is shown on the Status Line.
  - If the Holding Buffer is OPEN, BUFF is shown on the Status Line.
- The current status of Hardware Control signals:
  - While Pacterm permits the KPC-3 to send it data, RTS is shown.
  - While the KPC-3 permits Pacterm to send it data, CTS is shown.

To go from the TERMINAL Screen to the MAIN Menu, press the F1 key.

# Pacterm Commands: Overview

The following sections provide detailed specifications, helpful hints and technical information on Pacterm commands. You may refer to this material now or just start using the program and come back here later if you need more information.

## On-Screen Help

The MAIN Menu screen and Terminal Screen have enough information so you can use them as a guide to the commands available.

## From MAIN Menu, BACKSPACE = Go to Terminal Screen

Pressing BACKSPACE to go to the Terminal Screen is the usual first step in a session, once your COM port and BAUD rate are set up as you need.

MAIN Menu keys (except those used for SETUP or for EXIT to DOS) can also be used to go to the Terminal Screen.

## From Terminal Screen, F1 = Go to MAIN Menu

After you SETUP Pacterm and begin using the Terminal Screen, you will never need to return to the MAIN Menu, except to change SETUP values (COM port or BAUD rate) for the current session.

With the following exceptions, all commands that work on the MAIN Menu will also work from the Terminal Screen:

- SETUP commands only work on the MAIN Menu.
- ESC and CTRL+C are interpreted as data in TERMINAL MODE, so use them as data, not as ways to EXIT to DOS.

 **Hint:** To EXIT Pacterm from the Terminal Screen, use F10, or go to the MAIN Menu and use ESC or CTRL+C from there.

## Commands: Setup Pacterm, using the MAIN Menu

Pacterm needs to know a few things in order to communicate with your KPC-3:

1. Are you using Pacterm for Packet communication or HF Non-Packet communication? The KPC-3 is always used for Packet communication, so you will never need to change this setting when using your KPC-3. The reason Pacterm has this option is that some other Kantronics TNCs (e.g., KAMs) can be used with HF Non-Packet as well as with Packet communication.
2. What COM port is going to be connected to the TNC? The default “current COM PORT” is COM2, but you can switch to COM1.
3. What BAUD rate should Pacterm use to send data to the TNC? The default is 9600 BAUD, but you can select any of the following BAUD rates: 300, 600, 1200, 2400, 4800, and 9600.

☞ **Hint:** Pacterm begins each session with the default settings for COM port (COM2) and BAUD rate (9600), so if you are using non-default setting(s), you will need to use the relevant SETUP function(s) to start each session.

### F3 = Select TNC Use (default = Packet)

Pressing F3 switches back and forth between two uses of your TNC: with Packet communication (default) or with HF Non-Packet communication. The current setting for this is shown on the MAIN Menu screen.

KPC-3 users should always have Packet selected. Kantronics' KAMs can operate using either Packet or HF Non-Packet communication. Several functions work differently in HF Non-Packet, so you should not select HF Non-Packet communication unless that is what you want to do.

☞ **Hint:** If you accidentally press the F3 key and switch uses of your KPC-3, you will know right away because: (1) the display of the current TNC use will change from Packet to HF Non-Packet, and (2) a box will appear in the lower right of the screen, showing additional functions that are for use with HF Non-Packet communication instead of Packet communication. To switch back from HF Non-Packet to Packet communication, simply press F3 again.

## F7 = Select SERIAL PORT (default = COM2)

The KPC-3 can operate with any COM port on your computer, but Pacterm can only be used with COM1 or COM2.

Pressing F7 switches the current COM port from COM2 to COM1, or back. Pacterm's default COM PORT is COM2, so you do not need to do anything if you have your KPC-3 connected to COM2.

If you have your KPC-3 on COM1 rather than COM2, you will need to press the F7 key each time you start Pacterm. Just press F7 on the MAIN Menu before pressing BACKSPACE to go to the Terminal Screen.

- ☞ **Hint:** You could also use F7 to switch between two different TNC's, one connected to each COM port.

## F8 = Select BAUD RATE (default = 9600)

Pacterm can send and receive data through the current COM port at any of the following BAUD rates: 300, 600, 1200, 2400, 4800, 9600 (default).

---

**Technical note:** *At these levels, baud rate is essentially the same as bits-per-second.*

Press F8 to step through the available baud rates. Pacterm's current BAUD rate is shown on the MAIN Menu.

Since data flows back and forth between Pacterm and your KPC-3, both need to be using the same BAUD rate for the communication to work. Pacterm always starts a session at 9600 BAUD. If your KPC-3 is also set for 9600 BAUD, you will not have to change the setting.

- ☞ **Hint:** If data sent from the KPC-3 is garbled in the Viewing area of Pacterm's Terminal Screen, this may be due to a mismatch between the Pacterm and the KPC-3 BAUD rate. One way to coordinate them is to use F8 to step through various BAUD rates for Pacterm, until incoming data is readable. Of course, this may mean settling for a common BAUD rate that is less than optimal. Another way to fix the mismatch is to change the KPC-3's ABAUD parameter to match Pacterm's current BAUD rate. See the KPC-3 documentation on the ABAUD command for details on how to do this.

## Commands: Controlling the Flow of Data

Data are ordinarily sent immediately from Pacterm to the KPC-3, and from the KPC-3 to Pacterm, but you may halt the flow of data in either direction.

---

**Technical note:** To avoid losing data, Pacterm and the KPC-3 each need to know when they have “permission” to send data to the other. Pacterm and the KPC-3 achieve this coordination using **hardware flow control** signals on the RS-232C cable connecting the two devices: (1) the KPC-3 changes the status of the CTS (clear to send) signal on one wire in the cable to tell Pacterm whether it is OK or NOT OK to send it data, and (2) Pacterm changes the status of the RTS (request to send) signal on another wire in the cable to tell the KPC-3 whether it is OK or NOT OK for the KPC-3 to send data to Pacterm. The current status of each hardware control signal is shown on the right end of the status line (RTS is ON or OFF and CTS is ON or OFF).

---

### F5 = Pacterm to KPC-3: Offline or Online (default)

Pressing F5 (from either the MAIN Menu or the Terminal Screen) switches between two options controlling when data are sent from Pacterm to the KPC-3:

1. ONLINE = immediate transmission of data to the KPC-3 as you enter it from the computer (default setting), and
2. OFFLINE = type ahead, which orders Pacterm to stop the immediate transmission of data and save the data in a transmission buffer, also called a type-ahead buffer, for transmission to the KPC-3 when you switch back ONLINE.

**Caution:** Don't go OFFLINE for long. Pacterm's type-ahead buffer (transmission buffer) holds a maximum of 1,024 characters, after which old data will be discarded to make room for new data (i.e., it is a “first-in first-out” buffer)

The status line on the Terminal Screen shows either ONLIN or OFLIN.

## F6 = KPC-3 to Pacterm: STOP or START (default)

Pressing F6 (from either the MAIN Menu or the Terminal Screen) switches between the following two options for data-flow from the KPC-3 to Pacterm:

1. START = Request that data be sent from the KPC-3 to Pacterm, beginning with any data previously held in the KPC-3 while data-flow from the KPC-3 was STOPPED.
2. STOP = Do not send data from the KPC-3 to Pacterm; instead, hold it for sending when data-flow from the KPC-3 is enabled (START).

☞ **Hint:** While the KPC-3 is STOPPED from sending to Pacterm, data are saved in the KPC-3 in a temporary buffer, until the buffer is full. When this buffer is full, your station will give a **BUSY** signal to other stations that try to connect.

The status of this command (START or STOP) is shown on the Status Line.

---

**Technical note:** *START is a request for the KPC-3 to send any new data to Pacterm. Before new data will actually be sent to Pacterm, however, Pacterm must be able to receive material (RTS is ON), as indicated by RTS shown on the Status Line. While it is SAVING the contents of the Holding Buffer, for example, Pacterm turns RTS OFF automatically, so new material from the KPC-3 will not be lost during the saving operation.*

---

## Commands: Output Control

Pacterm provides the following output controls:

- PRINT data as it is shown in the Viewing area of the Terminal Screen.
- SAVE data shown in the Viewing area of the Terminal Screen in a Holding Buffer, whose contents can later be saved as a file.
- SEND a copy of a file to the KPC-3.

## ALT+P = Printer: ON or OFF (default)

This controls whether or not new material appearing in the Viewing section (top) of the TERMINAL Screen will also be sent to your printer. Pressing the ALT+P key combination from either the MAIN Menu or the Terminal Screen switches PRINT from OFF to ON and from ON to OFF.

- ☞ **Hint:** If you request printing and your printer is not turned on, is out of paper, or is otherwise unavailable, Pacterm will let you know, so you can correct the problem and try again.

The word PRINT appears on the Status Line when the Print request is ON.

Pacterm assumes that your printer is (1) a generic dot matrix text printer, such as an Epson MX, which operates on a line by line basis, responding to carriage returns and line feeds, and (2) it is connected to your computer's LPT1 port.

- ☞ **Hint:** If your printer (e.g., some laser printers) cannot be configured to operate as Pacterm requires, you may get print-outs by copying material to the Holding Buffer, saving it as a file, then using any text editor or word processor to bring in the (ASCII) file and print it.

**Caution:** Using ALT+P to turn PRINT OFF while printing may cause errors.

## ALT+B = Holding Buffer: OPEN or CLOSE (default)

This command OPENS and CLOSES Pacterm's Holding Buffer, which can be used to store and later save up to 45K of data sent from the KPC-3 to Pacterm.

To OPEN the Holding Buffer, press the ALT+B key combination; to CLOSE it, press the ALT+B key combination again. You may OPEN and CLOSE the buffer as you wish, until it is full, to "grab" the parts of a session that you may want to save to a file.

When the Holding Buffer is OPEN, data sent to Pacterm and appearing in the Viewing area of the Terminal Screen will be added to whatever has already been stored in the Holding Buffer. While the Holding Buffer is CLOSED no new data can be added, but what is already stored there stays until you clear it, save it, or exit Pacterm.

☞ **Hint:** When the Holding Buffer is OPEN but full, PaTerm will automatically CLOSE it if there is an attempt to add any more data to it. This means that once it is full, the Holding Buffer will not be able to accept any more data during the current session until it is cleared or saved.

When the Holding Buffer is OPEN, the term BUFF appears on the Status Line of the Terminal Screen.

## ALT+C = Holding Buffer: CLEAR

Press the ALT+C key combination to CLEAR (delete) the current contents of the Holding Buffer, whether it is currently open or closed.

**Caution:** This command takes effect immediately and it cannot be undone, so be sure you want to CLEAR the Holding Buffer before you use this command.

## F2 = Holding Buffer: SAVE and CLEAR

Press F2 to SAVE the current contents of the Holding Buffer to a file in the current directory (or to the current directory of a designated drive, if you include a drive name with the file) and then automatically CLEAR the Holding Buffer.

You will be asked to supply a name for the file, using the standard DOS file name conventions, and press ENTER to initiate the SAVE operation.

You may also include a drive name, along with the file name, to save the file in the current directory on a drive other than the current drive. The drive name is included in the 14 characters available for the name (e.g., add "C:" to the beginning of the file name to store the file in the current directory of drive C).

☞ **Hint:** Give the file name fairly promptly (e.g., within a minute or less). This is because as soon as you ask to SAVE the Holding Buffer contents, Pacterm will automatically STOP the flow of data from the KPC-3 (turn RTS OFF), so you can enter a file name and SAVE the current contents of the Holding Buffer without losing any data from the KPC-3. During this time, new data are stored in the KPC-3's temporary buffer, and when this buffer is full the KPC-3 will not accept further incoming data. After the Holding Buffer has been saved, Pacterm will automatically enable the flow of data from the KPC-3 (RTS ON, unless Pacterm's F6 control is set to STOP) and the KPC-3 will send the contents of its temporary buffer to Pacterm before sending new data.

If you enter an invalid file name, or if the Holding Buffer is empty, Pacterm will notify you so you can return to the Terminal Screen.

**Caution:** If the drive where you try to SAVE the Holding Buffer contents does not have enough space available to save the file, or if the drive door is open, you will get the standard DOS message: "Not ready reading drive (n): Abort, Retry, Fail?" If you can fix the problem (e.g., shut the door or insert a disk with enough space, if you are saving to a floppy drive), do so, type R (for Retry) and press the Enter key. To withdraw the SAVE request, type F (for Fail) and press the Enter key. If you type A (for Abort) and press the Enter key, you will EXIT to DOS, which means the Holding Buffer will be cleared without being saved.

**Caution:** If you enter a valid DOS file name, Pacterm will use it without checking to see if you already have a file by that name in the current directory (or in the current directory of a designated drive, if you include a drive name with the file). Be careful not to use a file name already in use, unless you want to write the new file in place of the old one.

## Two ways to Save Holding Buffer Data

There are two ways to save the current data:

- Binary file: To save the data without making any changes to it (e.g., to save a downloaded binary file), give the extension "BIN", for "binary," as part of the file name.

- Text file: If the file does not have the BIN extension, Pacterm:  
(1) removes all control characters except those for carriage returns and tabs, (2) adds line-feeds to carriage returns, so text will flow from line to line rather than overwriting the same line again and again with each carriage return, and (3) adds additional carriage returns and line feed characters where needed to force the material to “wrap” appropriately when it is displayed on a screen (after 75 or 80 characters, depending on whether or not there is a space character at the beginning of a given line). Note that since the backspace control character, used to backup and overwrite typing errors before sending data, will be filtered out, both original and corrected characters will remain in the data that are saved.

---

***Technical note:*** In both cases, Pacterm will add an “End of File” (EOF) code (CTRL+Z) at the end of the data from the Holding Buffer.

---

## ALT+F = Send a File to your KPC-3

You can use Pacterm to send a file from your computer to your KPC-3, which is then responsible for sending it on to your transceiver for transmission:

1. Use Pacterm to put your KPC-3 in either Conversation Mode or Transparent Mode connection with another station. In Conversation Mode, control characters are interpreted as commands rather than as data. If you are sending a text file for transmission by your KPC-3, you may wish to have the KPC-3 in Conversation Mode. If you want all control characters passed through as data, use Transparent Mode. Do not have your KPC-3 in Command Mode, since it would then interpret data being sent to it by Pacterm as commands.
2. After setting up your KPC-3 to handle the file it is going to receive from Pacterm, press the ALT+F key combination to start the SEND file operation.
3. Pacterm will put a small square marker in the data-input area of the Terminal Screen and wait for you to enter a DOS file name. Type the file name. Do not include any blanks before or after the file name.  
☞ **Hint:** If the file is in the current directory on a drive other than the current drive, include the drive name (e.g., C:) before the file name.

4. Press the ALT+F key combination again to ENTER the name. PaTerm will respond by (1) putting another small square marker on the screen right after the file name, (2) locating the file, and (3) sending a copy of it to the KPC-3.

**Caution:** If you give a file name that PaTerm cannot find, that is illegal, or that is bounded by any blanks, PaTerm will not respond to the second ALT+F command, so nothing will happen. Try again, starting with Step 2.

5. If your KPC-3 is in Conversation Mode (but not if it is in Transparent Mode) and it is set to ECHO, data will be echoed to the Terminal Screen.

**Caution:** Sending continues until PaTerm finds an end-of-file code. If the file does not have an EOF code (CTRL+Z), some or all of the file will be sent *and resent* until you EXIT to DOS to end the current session. To send such a file successfully, add an EOF code (e.g., by using an appropriate word processor).

## Commands: Exiting

The following *exit* commands are available in PaTerm:

### F9 = Switch your KPC-3 to Command Mode

From either the MAIN Menu Screen or the Terminal Screen, press the F9 key to switch your KPC-3 from Conversation Mode or Transparent Mode communication to Command Mode (for the NEWUSER or TERMINAL Interface Mode, whichever your KPC-3 is in at the time). Once in Command Mode, the KPC-3 will interpret data from PaTerm as being commands to carry out, not as data to transmit.

---

**Technical note:** PaTerm forces this switch by sending the KPC-3 a specially timed sequence of three CTRL+Cs (see KPC-3 documentation for details).

---

When you use F9 to exit from Conversation or Transparent Mode to the Command Mode, the “cmd:” prompt will appear in the viewing area of the Terminal Screen. If you are already in Command Mode, using F9 has no effect.

## F10 = Disconnect and EXIT to DOS

From either the MAIN Menu Screen or the Terminal Screen, press F10 to disconnect from a current connection that may have been established by the KPC-3, EXIT PaTerm and go to DOS.

Pressing F10 sends the command sequence “CTRL+C, CTRL+C, CTRL+C, D” to the KPC-3 before exiting to DOS. The sequence of three CTRL+Cs in quick succession changes the KPC-3 to Command Mode if it was not already in Command Mode, and the D is a short form of the DISCONNECT command.

**Caution:** If there is no connection at the time, the KPC-3 will report this fact, but you will not see this report at the time, since you will EXIT PaTerm immediately. You may see this message (“Can’t disconnect...”) when you start PaTerm again, since it will have been stored in the KPC-3’s temporary buffer, waiting to be sent at the beginning of a new PaTerm session.

- ☞ **Hint:** If your KPC-3 is turned OFF when you press F10, your computer may freeze up when these commands are sent by PaTerm. Try turning the KPC-3 back ON and using F10 again to EXIT. If there is no response, just reboot your computer and start another PaTerm session.

## ESC or CTRL+C (on Main Menu only) = EXIT to DOS

From the MAIN Menu, you can EXIT directly to DOS by pressing the ESC key or by pressing the CTRL+C key combination.

When you are on the Terminal Screen, you *cannot* EXIT to DOS by pressing ESC or CTRL+C. This is because at this time these are legal characters that can be sent to the KPC-3, so they will just be added to the data stream. In Transparent mode, each of these control characters will display as a graphic character in the data shown on the Terminal Screen.

- ☞ **Hint:** From the Terminal Screen, you may press F10 to Disconnect and EXIT to DOS or use F1 to go to the MAIN Menu, from where you can use ESC, CTRL+C, or F10, to EXIT to DOS.

## HF Non-Packet Functions (For KAMs Only)

This section is not relevant to KPC-3 users. It is included as part of a full description of Pacterm and as brief documentation for users of Kantronics' KAM TNCs with the following HF non-packet modes:

- RTTY
- ASCII
- AMTOR
- PACTOR
- G-TOR
- CW

As noted above, pressing F3 switches Pacterm between use with Packet and use with HF Non-Packet.

 **Hint:** When Pacterm is set to work with HF non-packet modes of communication, you can send a CTRL+C code to the TNC either by using the appropriate Pacterm function or by entering the CTRL+C key sequence from the keyboard.

## Commands that Work Differently in HF Non-Packet Mode

When Pacterm is in HF non-packet mode, the following commands have an “X” added to the string of characters they send to the TNC:

- F9 = Go to “Command Mode.”  
 **Hint:** You need to return to the TNC’s Command Mode (and to Packet use of your TNC) to change from one HF Non-Packet mode to another, so your TNC will be able to accept the command for the next HF non-packet mode. You can do this without using F3 to switch to Packet mode, if you are just switching from one HF non-packet mode to another. If you do want to switch to Packet use of your TNC, press F9 to go to Command Mode, then F3 to switch to Packet use of your TNC.
- F10 = Disconnect (Break Link) and Exit to DOS.

## Additional Commands for HF Non-Packet

The commands listed below are only available during HF Non-Packet use of the TNC (and only then are they shown on the Main Menu screen, in a box in the lower right of the screen).

### **ALT+T (transmit) = Exit Type-ahead**

This command can be used with all the HF Non-Packet modes listed above.

ALT+T sends a CTRL+C T CTRL+M sequence to the TNC. This causes the TNC to key the radio and transmit the data in the TNC's buffer. And if the F5 command had been used to put Pacterm in the type-ahead mode (offline), the status line will change to show Pacterm as online (ONLIN).

### **ALT+R (receive) = Return to type-ahead**

This command can be used with all the HF Non-Packet modes listed above.

ALT+R sends a CTRL+C R sequence to the TNC. This will immediately return the TNC to the receive mode, even if there is still data in its transmit buffer. Data in the TNC's transmit buffer will be saved for transmission later.

- ☞ **Hint:** See ALT+E if you want to transmit all data in the TNC and then switch to receive mode.

### **ALT+E = Return to Receive**

This command can be used with all the HF Non-Packet modes listed above.

ALT+R sends a CTRL+C E sequence to the TNC. This will allow the data in the TNC transmit buffer to be sent and then return the TNC to receive mode.

- ☞ **Hint:** Used ALT+R when you want to hold the data in the TNC transmit buffer and return the TNC to receive mode.

## **ALT+H = Shift Tone Pair Frequencies**

This command can be used with the following HF Non-Packet modes: RTTY, ASCII, and AMTOR.

ALT+H sends a CTRL+C S sequence to the TNC. This command changes shifts in RTTY, ASCII, and AMTOR modes.

## **ALT+I = Invert Received Signal (rtty/ascii)**

This command can be used with the following HF Non-Packet modes: RTTY, ASCII, and AMTOR.

ALT+I sends a CTRL+C I sequence to the TNC. This command inverts the received signal in RTTY, ASCII and AMTOR modes.

## **ALT+S n = Speed Change**

This command can be used with the following HF Non-Packet modes: RTTY, ASCII, and CW.

ALT+S **n** sends a CTRL+C **n** sequence to the TNC, where **n** is a number from 0 to 9. This command lets you change the speed at which you will transmit in RTTY, ASCII or CW modes.

In RTTY or ASCII mode, **n** selects the **n**th item on the TNC's list of 9 pre-programmed speeds. Use the value of **n** = 0 to change to the current value of RBAUD or ASCBAUD, which may or may not be set to the default value (default values are: RBAUD = 45, ASCBAUD = 110).

In CW mode, ALT+S **n** sets the transmit speed to  $5 * n$  words-per-minute (e.g., ALT+S 3 =  $5 * 3 = 15$  words-per-minute). In CW mode, use **n** = 0 to set the transmit speed to 50 words-per-minute (0 is interpreted as = 10, yielding  $5 * 10 = 50$  words-per-minute).

# Trouble-Shooting Difficulties in Communicating

If you are having difficulty establishing and maintaining communication between Pacterm and your KPC-3, here are some more points to consider in addition to those covered on the “Pacterm Cannot Communicate” screen.

## Problem: Go to Terminal Screen, but Nothing Happens

One possibility is that the current COM port does have a device on it, but it is not a KPC-3. It might be a mouse or an internal phone modem, for example. To see if it is a mouse, go to the TERMINAL Screen, start moving your mouse and see if sequences of characters appear as you move the mouse. If so, change the COM port setting in Pacterm and try again.

## Problem: Your Computer Freezes Up

When Pacterm gets the go-ahead signal for communicating, it will act on the assumption that the signal is from your KPC-3. There is no way Pacterm can verify that the signal is actually coming from your KPC-3 and not from another device on the current COM port (e.g., a mouse, or an internal phone modem). So if the device on the current COM port is not a KPC-3, Pacterm will be running under a misunderstanding and, in this case, your computer may “freeze-up,” requiring you to turn it off, re-start it, and take steps to correct the problem before running Pacterm again.

## Problem: You Are Getting Bad or Intermittent Data

Many PC compatible computers are designed with a built-in potential conflict that may cause a problem: Both COM2 and COM4 (and both COM1 and COM3) may use the same interrupt (IRQ) mechanism to get the attention of the computer. This means that if devices on both COM2 and COM4 (or both COM1 and COM3) are sending signals to the computer at the same time, this can cause problems for programs, such as Pacterm, that use either COM port. If you are getting bad data, check to see if you have another device that might be getting confused with your KPC-3 (on COM4 if your KPC-3 is on COM2; COM3 if your KPC-3 is on COM1) and make it inactive or remove it while using Pacterm with your KPC-3.

## Problem: Your KPC-3 Stops Behaving Normally

Pacterm is intended for use with a KPC-3 in NEWUSER or TERMINAL Interface Mode (or, less often, in BBS or GPS Interface Mode), but it may receive data from the KPC-3 in any Interface Mode. Non-response, garbled data, or partially garbled data may indicate the KPC-3 has been switched to HOST or KISS mode and needs to be switched back to NEWUSER or TERMINAL. See the KPC-3 documentation for instructions on how to determine what Interface Mode your KPC-3 is in currently and how to change it to the Interface Mode you want (NEWUSER or TERMINAL).

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# Kantronics

## Pacterm

**Serial Communication  
with Kantronics TNCs**

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